VECTOR >

Synchronizing Fault Memories Across Controller Boundaries

Case Study vDes

The Diagnostic Event Synchronizer vDes is part of the Vector AUTOSAR solution MICROSAR.

The Challenge
Distribution of monitor functions for diagnostics on multiple controllers.

In multi-controller systems, monitor functions for error detection are distributed among multiple microcontrollers. The different microcontrollers can be installed on the same or on different ECUs.

However, only the master controller communicates with the diagnostic tester via Unified Diagnostic Services (UDS). If the different controllers calculate the error states exclusively via the master controller, this would greatly reduce the performance of a distributed system. The monitor functions should be performed identically on both the master and the slave controller to keep the system simple. Synchronous function calls of the application via the Diagnostic Event Manager (Dem) - the error memory defined in AUTOSAR - should only be executed via the local Dem in order not to block the Dem module on the master controller.

The Solution
MICROSAR vDes diagnostic module from Vector.

The Diagnostic Event Synchronizer (vDes) integrates as a Complex Device Driver (Cdd) into the AUTOSAR basic software. Together with other basic software modules from MICROSAR.DIAG, you can efficiently synchronize multiple fault memories across microcontroller boundaries. The module is used on the master and slave controller. This reduces the necessary Remote Procedure Calls (RPC) between both processors.

The AUTOSAR diagnostic module Dem is integrated on both the master and slave controllers. Reported monitor states are debounced on the slave controller. Storage in NV-RAM only takes place on the master controller. All information on locally managed errors can be accessed via the interfaces of the Dem module as usual.vDes monitors the fault memory and synchronizes relevant changes with the master controller. The necessary RPCs are reduced to a minimum. Messages via the AUTOSAR PDU Router (PduR) implement the RPC connections. In this way, the bus system

used in the system is connected and abstracted from it at the same time. The solution is therefore independent of the physical connection.

The Advantages
Easy integration of the vDes using the AUTOSAR interfaces.

> Allows the distribution of the application software to multiple controllers without loss of performance
> Completely transparent for the UDS tester
> Monitor function on master and slave controllers use AUTOSAR interfaces
> NV-RAM for error storage is only required on the master
> Reduced RPC communication between master and slave

More information: www.vector.com/microsar

vDes: Efficient synchronization of fault memories.